

REMARKS

Reconsideration of the application is requested in view of the amendments to the claims and the remarks presented herein.

The claims in the application are claims 1, 3 and 5, all other claims being cancelled.

All the claims were rejected under 35 U.S.C. 102 as being anticipated by Chapaton and Brannock patents which according to the Examiner teach 2-hydroxymethylnorbornane based carboxylic acid esters, a method of preparing them and are in lubricants.

Applicants respectfully traverse these grounds of rejection as the prior art cited by the Examiner does not anticipate or render obvious applicants' invention which is directed to diesters of 2-hydroxymethyl-norbornane and their preparation and their use as lubricants and as plasticizers for thermoplastics. The Brannock patent is directed to carboxylic acid diesters of 2-hydroxymethyl-2-methyl-norbornane having 5 to 10 carbon atoms in the alkylene chain. The 2-hydroxymethyl-2-methyl-norbornane is prepared by a Diels Alder reaction of a cyclopentadiene and methyl methacrylate followed by hydrogenating the unsaturated Diels Alder product of hydrogenating the ester moiety into the alcohol and acid compound with a copper chromite catalyst. The Brannock ester

compounds are useful as lubricants and the viscosity and Pour Points are varied according to the specific dicarboxylic acid (lines 8 to 13, col. 2).

However, the Brannock compounds differ from applicants' compounds by the 2-methyl substituent on the norbornane. Applicants are submitting herewith a declaration to demonstrate the unexpected improved characteristics of applicants' compounds as compared to Brannock's. The data in the declaration shows the improved characteristics for low temperature applications as lubricants and as plasticizers low viscosity means an easier work up of the plasticizers in thermoplastic polymers and leads to good cold flex properties in the thermoplastics.

Moreover, applicants process is more economical beginning with readily available norbornene which is hydroformylated to form 2-formyl-norbornane which is hydrogenated to form 2-hydroxymethyl-norbornane.


The data of Table 1 demonstrate the advantageous properties of the claimed diester compounds compared to compounds known from Brannock. Surprisingly, the structural modification of the compounds known from Brannock leads to diester compounds having low viscosity and Pour Point data with advantageous properties in the application as lubricant or plasticizer. In addition, no hint is given in Brannock to modify the known diester compounds in such a way, to use the norbornane moiety instead of the 2-methylnorbornane moiety in order to obtain diester compounds having low viscosity and Pour Point data.

Further the diester compounds of the present application are prepared in an economical advantageous way. As disclosed on page 4, lines 7-25, the alcohol component is prepared from norbornene, which is readily available. Norbornene is first hydroformylated to give 2-formylnorbornane, which is then hydrogenated to the 2-hydroxymethylnorbornane. In contrast thereto, the preparation according to Brannock requires first the hydrogenation of the Diels Alder product and then the hydrogenolysis of the ester moiety into the alcohol moiety (column 2, lines 3-7). However, the hydrogenolysis of the ester moiety requires more drastic reaction conditions than the hydrogenation of the aldehyde, in order to yield the alcoholic starting material. Such ester hydrogenolysis reactions are commonly conducted in the presence of copper chromite catalysts, which processes have to be carried out under particular safety conditions due to the Cr(VI) content in the copper chromite catalysts. In contrast to the procedure taught by Brannock, the diester compounds of the instant application are available from cheap raw materials under process conditions, which are conducted in an environmental friendly manner. Therefore, Brannock does not anticipate or render obvious applicants' invention and withdrawal of this ground of rejection is requested.

With respect to the Chapaton et al. patent, the patent does not anticipate or render obvious the present claimed diesters of carboxylic dicarboxylic acids of 3, 4, 7, 8 or 10 carbon atoms (combined claims 1 and 2) as compared to Chapaton et al. compounds which are esters of malonic acid and succinic acid. Moreover, applicants' compounds have the advantageous properties shown in the declaration discussed above. Therefore, withdrawal of this ground of rejection is requested.

In view of the amendment to the claims and the above remarks, it is believed that the claims point out applicants' patentable contribution. Therefore, favorable reconsideration of the application is requested.

Respectfully submitted,
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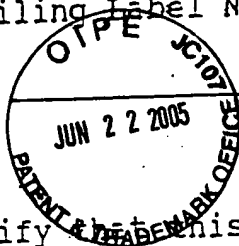
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